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ABSTRACT

Conceptualizations concerning role changes of classroom teachers due to the use of computer assisted instruction (CAI) are contingent upon what system is used and how long it takes. However, some factors within CAI which may cause teacher role changes can be identified. Also, it is likely that the pattern of computer development will be gradual, culminating in a new form of individualization due to the availability of advanced computers and multimedia resources and to the differentiation of staffing. The teacher's role, then, can potentially change toward involving more strategizing, managing, individual counseling, discussing, specializing, and diagnosing functions; and fewer correcting, lecturing, and disciplining functions. Future teacher education programs should feature CAI and prepare teachers for these new roles. (SP)

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CAI CENTER

TECH MEMO

IMPACT OF CAI ON CLASSROOM TEACHERS

Duncan N. Hansen and William L. Harvey

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ABSTRACT

Impact of CAI on Classroom Teachers

The predominant factors within CAI that may cause changes in teacher roles are discussed in terms of the requirements for new guidance and modeling skills for the teachers, the requirements for technical competencies and the control of CAI development. In turn, the pattern of potential CAI development is discussed in terms of individualization, the role of computer-managed instruction and the ultimate complexities of diversed CAI. This lead to a description of seven potential role changes for teachers in terms of their day-to-day behaviors. The article is concluded with a discussion of the implications for teacher training.

IMPACT OF CAI ON CLASSROOM TEACHERS

Duncan N. Hansen and William L. Harvey

Computer Technology as a resource for education is fast becoming a disseminated reality. How this computer reality will effect the professional roles of classroom teachers remains a conceptual issue at present. This is primarily due to at least two contributing factors. First, some educators would prescribe future teacher roles contingent upon a dramatic, completely computerized school environment, whereas others would foresee a more gradual evolution from current teacher roles to that new state yet to be determined by future developments. More precisely, there is a speculative time continuum that spans from the existing world of 1969 to that of the year 2000. The projections or predictions about potential teacher role vary considerably as one moves within this time range.

In reference to the second source of ambiguity, the nature of computer-assisted instruction (CAI) encompasses a wide range of in-instructional activities that allow for potential impact on teacher roles. This range of views about CAI can be characterized as moving from the simplistic view of CAI as a resource similar to a motion picture projector onto the auto-tutor view of CAI as a teacher-substitute. As sub-issues within this range of views about CAI, the degree and kind of individualization of the instruction and the degree of instructional control offered to the student generate additional

exemplars of potential CAI influences on teacher roles. Moreover, the complexity of the instruction may determine the degree to which computers may be involved, that is, mathematical problem solving can become highly complex and completely dependent upon computers, whereas a rich discussion of poetry obviously has elements incongruent with computer support. Thus the range of CAI activities and its associated implementation leads to a wise range of predictions about future impacts on classroom teachers.

For the purpose of this article we will analyze some of the factors within CAI that may cause changes in teacher roles. Secondly, a brief description of a possible pattern of development of CAI likely to occur within public schools will be presented along with its resultant impact for classroom teacher-role specification. In turn, some of the obvious role functions that will undergo shifts as CAI becomes a more permanent activity will be discussed. And finally, the article will be concluded with a brief statement on potential implications for teacher training in order to better prepare future teachers for the world of the 1980's.

Role Factors.--Primary within the consideration of role factors is the allocation of teacher activities during the school day. As CAI absorbs more of the information presentation and correctional functions, the teacher obviously will be in a better position to allocate her limited time to other functions, such as group discussions, social modeling tehcniques, guidance, etc. The ratio of time that a teacher may allocate to these enriching functions should in a large measure set the tone of future professional roles.

In turn, the professional associations are likely to exert influence on the selection of "desirable teaching behaviors" and will therefore determine what is considered legitimate and illegitimate roles. If our professional societies demand a specialized CAI teacher, this new career pattern will undoubtedly be created. Or, in turn, if the professional societies wish to maintain intimate control of CAI development, this would require the classroom teacher to become much more proficient in her understanding and use of computer technology. This requirement for new teaching competencies will center around computers and would necessitate the training of teachers in the knowledge and behaviors necessary to operate many of the functions of the computer, i.e. teachers would be required to understand the operational procedures of the computing system, how to sign on and sign off, plus the multitude of specific directions which absorb so much of our current activity in the CAI world.

These highly technical competencies imply that one may see greater differentiation of professional roles in the future. One can anticipate a greater team approach to the instructional endeavor with better use of the natural talents found in the professional ranks. Thus it is likely that one of the impacts will be a serious reanalysis of the time allocation for teachers, tempered by the constraints of the professional societies. Further, a growing differentiation of legitimate and illegitimate roles should be defined in order that a wider range of hierarchically trained teachers will be found working in our schools.

Pattern of Computer Development.--Public schools are likely to adopt a gradual program of computer involvement. This pattern will be mediated by the roles teachers will accept plus the technical and

professional training of the staff. We foresee a five-step pattern of development. First, a commitment to individualization of instruction would be required in order to create the need for CAI. Second, the development of Individually Prescribed Instruction (IPI) utilizing most of the conventional materials presently available would be the obvious subsequent step. Third, the development of the Computer-Managed Instruction (CMI) as an appropriate aid in the managerial functions found in the complexities of IPI would naturally follow. Fourth, the availability of CAI and related multi-media devices probably would become available in order to broaden and enhance the educational resources for individualized learning. Finally, a new form of individualization in our schools could occur due to the availability of even more advanced computers and multi-media resources plus the shifts in staffing. Contingent to each one of these steps will be the requirement to provide professional development and new role definitions so that effective evolution towards a more individualized school can take place. Each transition from one of these stages to the next will result in dramatic changes away from our current classroom activities.

Potential Teaching Role Changes.--As there has been little investigation to date, other than a pilot study performed in Philadelphia (1969), one has to speculate on the potential role changes associated with the evolutionary pattern described above. It seems reasonable, based on the preliminary study on CAI teachers at Philadelphia plus the role factors and patterns of development for CAI, to predict the following teacher role changes.

1. The teachers will perform much less of the informational presentation functions presently found in our classrooms. Undoubtedly, the teacher will become much more involved in the managerial and strategy functions found in the sequencing and evaluation of the instructional process.

2. Teachers will play less of the corrective role in terms of their questioning and evaluative behaviors. This undoubtedly will offer a significant step forward in teacher-student relationships in that much of the negative verbal behavior observed in classrooms will now be shifted to a more individualized and private interaction within CAI.

3. Teachers will become much more concerned with the host of individual characteristics important in designing an instructional strategy; thus the array of instructional resources and the decision making found in employing these resources will become more complex and also more frequent in terms of teacher behaviors.

4. The teacher will have a greater involvement in guiding individual students rather than maintaining classroom discipline. With the computer relieving the teacher of the informational presentation tasks, she will be able to devote the time usually expended in group communication to individual counseling and advising.

5. Teachers will have to perform a wider range of discussion techniques involving a richer opportunity to affect the social and emotional behavior of students. Teachers will have to have greater skill and understanding of human behavior viewed in the broadest terms. This requirement may in part be aided by the CAI system's information retrieval capability which may monitor the patterns and rates of student development.

6. It is clear that the teachers will have a greater array of differentiated professional joining them in the team effort to provide optimal instruction. Thus some teachers may become experts in the guidance process, while others may become more competent in the application of technological procedures and functions for the fullest employment of computer technology.

7. Teachers may take on many more of the diagnostic assessment and prescriptive functions presently assigned the school psychologist. Teachers may, in fact, utilize more group interactive procedures in an attempt to develop latent social and creative talents within their students.

These potentially more precise but sophisticated professional roles, which are more creative and interesting, should offer a more promising world to our classroom teachers. While the threatening implications of computers are not to be minimized, it is clear that computers can become one of the greatest resources that the classroom teacher has ever been offered.

Implications for Teacher Training.--Teacher training institutions have a challenge to anticipate the changing role of the teacher rather than follow at the heels of classroom practice. To accomplish this goal a closer relationship between schools of education and computer developments within local school districts will be required. When this harmony is present, basic research and development could be performed that will give necessary insight into the full implications of technology on classroom practice.

Since the new roles of the teacher of the future can only be surmised, the changes in teacher training must also be a conjecture.

It is perhaps safest to suggest that teachers in general will become more specialized at every level of instruction. Teachers may have a wide range of specialities to select within a differentiated staffing scheme. The "classroom manager" or master teacher may only represent one career pattern.

Within a school of education, a first step would be to have the computer as a monitor of prospective teachers learning their curriculum. This pattern of CMI would allow the teacher candidate to select one of many paths towards performance objectives deemed important for their role in the school. If the teacher colleges pioneer these CMI programs, the extension to the public schools should be a natural evolution.

With the computer assuming the major responsibility for information dissemination, the teacher's role is likely to revolve around human relations, instructional strategies, construction of learning materials, and learning research. These priorities would suggest a major departure in course requirements for teachers. These creative requirements may very well attract a different type of college student into the teacher training program. Hopefully the final results of this reorganization would be more effective instruction for the student and a more rewarding and professional role for the teacher.

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